Mid-Atlantic Regional Assessment (MARA)
of the Potential Consequences of Climate Change and Climate Variability

Project Summary

The National Assessment Process

In 1997, the U.S. Global Change Research Program (USGCRP) initiated a national, scientifically-based assessment of the consequences of climate change and climate variability for the people, environment, and economy of the United States. This is the first of an ongoing series of scientific assessments of global change that are mandated by the Global Change Research Act of 1990. The first National Assessment Report will be delivered to Congress in January 2000.

The goal of the first National Assessment is to determine the local, regional, and national implications of climate change and climate variability in the context of other existing and potential future stresses on human health, the environment, society, and the economy. Possible coping mechanisms for adapting to climate change are also being examined. The assessment includes 20 regional assessments, 5 sectoral assessments, and a broad National Synthesis Report. It is being conducted as a public-private partnership and will emphasize a process driven by the needs of the stakeholders throughout the country who are best positioned to identify priority information needs, and the most effective ways of responding. The structure of the assessment process reflects the fact that the effects of climate change will differ across regions, and people will experience these impacts where they live.

As part of this National Assessment effort, EPA's Global Change Research Program is sponsoring the Mid-Atlantic Regional Assessment, the Great Lakes Regional Assessment, the Gulf Coast Regional Assessment, and the Health Sector Assessment. A substantial number of EPA researchers from ORD's Global Change Research Program, the Office of Policy, and Region 3 are already involved in various aspects of the National Assessment, including, for example, Tom Barnwell (ORD/NERL), Tom DeMoss (EPA Region 3), Janet Gamble (ORD/NCEA), Anne Grambsch (OP/OEE), Hal Kibby (ORD/NHEERL), Suzanne Marcy (ORD/NCEA), Hugh McKinnon (ORD/NRMRL), Sue Norton (ORD/NCEA), John Paul (ORD/NHEERL), Catriona Rogers (ORD/NCEA), Joel Scheraga (ORD/Co-Chair of the National Assessment Work Group), Lowell Smith (ORD/NCEA), and Hal Walker (ORD/NHEERL).

The Mid-Atlantic Regional Assessment

With EPA sponsorship, a multi-disciplinary team of 14 Pennsylvania State University (Penn State) faculty members is leading the first Mid-Atlantic Regional Assessment (MARA) of the effects of climate change. This region includes all or parts of eight states (NY, NJ, PA, DE, MD, WV, VA, and NC) and the District of Columbia. Its boundaries are similar to those for EPA's Mid-Atlantic Integrated Assessment (MAIA), enabling the use of substantial background information generated for MAIA as input to the assessment process (particularly for

understanding the current status of resources within the region). The first draft MARA report will be completed by April 1999 for input to the National Assessment process.

Four questions guide MARA and the other regional and sectoral assessments:

1. What is the current status of resources in the region and what are the region's current stresses and issues of concern?

2. How might climate change and variability exacerbate or ameliorate existing stresses?

3. What new information is needed to better answer questions 1) and 2)?

4. What are the options for coping with climate-induced stresses or for taking advantage of potential beneficial opportunities?

A major MARA objective is to identify actions for increasing the region's resiliency to climate variability, reducing negative impacts and taking advantage of opportunities created by climate change. Another objective is to identify research needed for evaluating adaptation options.

Initial Workshops, Meetings and Assessment Activities

As an initial step in the MARA assessment process, Penn State held a Mid-Atlantic Workshop on September 9-11, 1997, focusing on the watersheds for the Chesapeake and Delaware Bays. The 92 participants, representing federal, state and local government, industry, academia, and public interest groups, learned about climate change and its potential for regional impacts. The workshop also focused on the importance of education and information dissemination, with a particular goal of providing information at scales fine enough to help stakeholders (*e.g.,* water managers and farmers) with their planning. Participants expressed strong concerns about potential impacts from sea-level rise on ecosystems and recreation, and about human health impacts. More information is available on the internet at http://www.essc.psu.edu/ccimar/.

A June 8-9, 1998 researchers' meeting explored questions raised during Penn State's September 1997 workshop and identified available data bases and current research useful for MARA. As a result of this open process, the assessment of climate impacts to six areas were deemed currently feasible and are being addressed in the first assessment: 1) Human health, 2) Water, 3) Coasts, 4) Ecoystem, 5) Forests, and 6) Agriculture.

The MARA report will provide an overview of baseline conditions and how they might be affected by climate change. In-depth case studies will illustrate important impacts as well as how impacts will vary within the Mid-Atlantic Region. For example, the assessment is examining potential consequences of forest changes for the timber industry as well as for campers or hunters who use forests for recreation. Farming practices may change with the climate, which could, in

turn, affect the health of waterways, or the safety of water supplies. Examples of other case studies include: potential impacts on fishing, ecological and land-use linkages that might affect the spread of mosquito-borne or tick-borne diseases, community water supply managers' information needs for coping with more variability in water sources, and the potential for increased damages from sea-level rise combined with possibly more frequent and intense storms.

Working groups for each of the six topics include collaborators from other universities and government. The assessment report will bring together information about diverse beneficial and detrimental impacts into a picture of the effects on the region as a whole. More detailed information can be found at http://lumen.deasy.psu.edu/mara/.

Stakeholder Involvement

To maximize is usefulness, the assessment must go beyond researchers analyzing data and summarizing results. Input from potentially interested parties (hereafter called stakeholders) can improve the assessment's usefulness by 1) indicating what information about climate change they need to make more informed decisions, 2) ensuring the assessment is responsive to climate-related concerns most important to the people who live and work in the region, 3) identifying existing relevant data not otherwise available to the assessment team, and 4) relying on their knowledge of regional and local social, cultural, and political institutions to help prioritize options for building resilience and flexibility within the region.

To tap this resource, Penn State has set up an Advisory Committee with 45 diverse stakeholders and 15 researchers (in addition to the aforementioned research collaborators). Most of these stakeholders participated in an October 19-20, 1998 meeting, during which they commented on Penn State's assessment plans and began to explore effective ways to display and communicate future results. In December, 1998, the Advisory Committee was asked for feedback on draft outlines for the working group reports. At a May 2-3, 1999 meeting, the full Advisory Committee will review the April draft of the assessment report and recommend specifics about how to display and disseminate the findings.

Looking Ahead to Activities in 1999

The draft MARA report and its supporting documents will be circulated for review, revised and submitted to the National Assessment Synthesis Team (coordinators of the National Assessment Synthesis Report). Concise versions will be submitted for a Special Issue of the journal, *Climate Research*. Team members will present results at professional meetings for additional peer review. The final products will serve as a baseline for future assessments, expected to be conducted on a 4-5 year cycle.

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